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ABSTRACT

This study examined the relationship of teaching style orientation, expressed perceptions of the teaching-learning process, actual classroom behavior, and learning styles of six full-time faculty in a dental auxiliary program at a large teaching institution. Data collection instruments used to assess this relationship included the Teaching Style Q-Sort, an interview protocol, classroom observations modified from Goldhammer's note-taking procedure, and the Learning Style Inventory. The subjects' teaching styles were identified as either social interaction, information processing, personal, or behavior modification. According to learning style, 163 dental hygiene students were categorized as either accommodators, assimilators, convergers, or divergers. Results showed a positive relationship between teachers' perceptions of their teaching style and their classroom behaviors. No relationship was determined for the teaching style and learning style inventories, although three teachers accurately predicted students' learning styles; teachers did not perceive their students' learning style to be like their own. This report provides 18 references and detailed data tables. The Teaching Style Q-Sort questions, the Teaching Style Interview, classroom behaviors categorized by family, and the Learning Style Inventory Scoring Graph are appended. (LMM)

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LINKING TEACHER THEORIES

TO

TEACHER PRACTICES

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The purpose of the exploratory research reported in this paper was to examine the relationships among teaching style orientations, expressed perceptions of the teaching-learning process, actual classroom behaviors and learning styles.

Six full-time faculty in a dental auxillary program at a large teaching institution agreed to be interviewed, to complete several inventories, and to have their classroom teaching observed. Although the small sample precludes generalization of results, the purpose of the study was to explore the feasibility and yield of information from this combination of methods.

Implicit Theories of Teaching

In several recent articles, David Hunt (1976, 1978, 1980) proposed that every teacher is not only a teacher but a psychologist and a theorist as well. Personal theories of teaching are derived from three sources. First, from former teachers who, regardless of their competance, serve as models for shaping a teaching behavior. Second, personal values and philosophies contribute to personal theories of teaching. And third, Hunt reasons that in the day-to-day activities of the classroom, teachers continually formulate, test, and revise hypotheses about relationships between teaching and learning. Over time, each teacher's findings aggregate into a point of view or an "implicit theory." Such theories are idiosyncratic because the teacher's personal characteristics and the environment in which he or she teaches influence the hypotheses formulated, the outcomes of the "tests" of such hypotheses, and thus, the conclusions. Among teachers then, such theories vary in richness of detail, strength, and comprehensiveness.

These personal belief systems or theories appear to affect how teachers perform in the classroom. Evidence suggests, for example, that these sets of assumptions and beliefs are reflected in the ways teachers structure learning groups (Janesick, 1977), select curriculum materials (Duffy, 1977), and conceptualize students (Hunt, 1976). To some degree, teachers appear to plan, interact with students, and perform other teaching activities in ways that are consistent with their implicit theories.

Argyris and Schon (1974) contend that people may have inconsistencies between their espoused beliefs and their behaviors. The authors say that if a situation demanding behavior or theory change is to occur, "events must emphasize the conflict between espoused theory and theory-in-use in ways that overcome normal attempts to avoid noticing the conflict" (p. 31).

Understanding teachers' current perceptions, or helping them make explicit their implicit theories, is an important precursor for encouraging change. Knox (1977) confirms this notion:

> Usually, when an adult sets out to learn about something it is related to a large amount of experience and information that the adult already possesses. The person's current understanding of the topic or problem is typically organized around his or her previous encounters with it. (Knox, 1977, p. 428)

Teaching Styles

Teaching style typologies represent another way to understand how teachers view their roles. The Teaching Style Q-Sort, developed by Michael Heikkinen (1977), is designed to identify teachers' tendencies toward four different teaching orientations. These four families of orientation are described by Bruce Joyce and Marsha Weil in their book, Models of Teaching (1977). The social interaction models emphasize interactions among the student, other people, and society. Priority is given to social relations and creating a better society. Information-processing models are concerned with how students collect, organize, and store information as well as how they solve problems. Personal models emphasize the personal development of students. Teachers strong on this orientation stress the personal psychology, self-concept, self-image, and creativity. Behavior modification models emphasize the careful delineation of goals and objectives, the measurement of observable behaviors, and the establishment of external conditions to shape student learning.

Observation of Teaching

To examine links between teachers' perceptions of their teaching and actual teaching practices, several class sessions were observed for each teacher in the sample. A modified version of Goldhammer's (Goldhammer, 1969) method of note-taking was used. This system consists of recording in writing what is seen and heard in the classroom as completely as possible.

The role of the observer is to record perceptions, not to make inferences. Data analyses involve detecting patterns of behavior. This is done by scanning the notes for the repetitious use of particular behaviors, reading the notes for substance, and then deleting value judgments the observer has made. Assigning patterns to catagories is then accomplished by fitting descriptions to sets of patterns.

Finally, these patterns of behavior are arranged in a hierarchy by evaluating their relative importance in terms of three criteria: saliency, fewness, and treatability. (Carrier and McInerney, 1981)

Learning Styles

Another factor which may contribute to how teachers deliver instruction is suggested by the research on learning styles (Price, Dunn & Dunn, 1977; Sadler & Plovnick, 1978). Learning style refers to an individual's characteristic mode of gaining, processing, and storing information during an educational experience. Learning styles are considered to be relatively stable traits which affect a wide range of behaviors. A prominent theory base for the concept of learning style emerges from the work of David Kolb (1975, 1981), who proposes a model of experiential learning to explain adult learning processes. This model posits four major stages which are cyclical in nature.

In the concrete experience stage, the learner must become actively involved in new experiences. These experiences are then reflected upon from several perspectives during the reflective observation stage. As a result of this reflection, the learner begins to formulate abstract concepts (abstract conceptualization phase). In the active experimentation phase, the learner

attempts to test the implications of these new concepts and begins to form generalizations. Althouth a progression through all phases is considered important in the learning process, Kolb and others have found that many learners exhibit strength in some area(s) more than in others.

Kolb's research, using the Learning Style Inventory, has revealed four distinct learning "types" which he has labeled accommodators, assimilators, convergers, and divergers.

Accommodators. This individual's strengths lie in concrete experience and active experimentaion. Accommodators like to do things, they become involved in new experiences. This person will rely on others more often than on personal analytic abilities for information in problem solving situations. If the theory doesn't appear to fit, the accommodator easily discards it. This person is at ease with others but is sometimes perceived by others as being impatient.

Assimilators. Unlike the accomodator, this individual is more likely to re-examine the "facts" if they don't fit the theory rather than to disregard the theory. Favoring abstract conceptualization and reflective observation, the assimilator excels in creating new theoretical models through inductive reasoning. Such a person is less interested in people and more concerned with models.

Convergers. This individual's dominant learning abilities are abstract conceptualization and active experimentation. Convergers are best at applying ideas to practical problems. They do well in situations that require a single correct response. Relatively unemotional, they prefer to deal with things rather than people.

Divergers. Just opposite of the converger, the diverger excels at concrete experience and reflective observation. This individual is imaginative, good at viewing concrete situations from many perspectives--a good brainstormer. The diverger is interested in people, tends to be emotional, and has broad cultural interests.

METHODS

Subjects

Faculty. Six faculty members, or 17 percent of the faculty in the Dental Auxillary Program responded to the four instruments. Five of the teachers were from the Dental Hygiene Program, and one teacher was from the Dental Assisting Program. Participation in the study was voluntary. The teachers' participation was usually based on their willingness to learn more about their own teaching and learning styles.

All of the teachers were between 28 and 58. All had bachelor's degrees; five had or were working on an advanced degree. Two of the degrees were in education. The number of years teaching varied between four and fifteen, with the average being 8.5 years.

Students. One hundred and sixty-three dental hygiene students, or 99 percent of those enrolled in a two-year certificate program, responded to the Learning Styles Inventory. Again, participation was voluntary. Students were asked to remain after class if they were willing to complete a survey about preference for instruction.

The students in the dental hygiene program were 99 percent female, between the ages of 19 and 25. Typically, a student possesses a high school diploma or an A.A. degree.

Instruments

Teaching Style Q-Sort

This instrument (Appendix A) allowed the investigator to examine questions related to the value and attitudes of the teachers. This inventory consists of 28 statements, each of which reflect one of the four families developed by Joyce and Weil. Examples of items from each of the four families are:

- Social interaction. "The teacher should take a role as a part of the group and be an active inquiries with the students."

- Information-processing. "Concepts are the basis for knowledge."

- Personal. "Instruction should emphasize the maximum of unique personal development."

- Behavior modification. "The sequence of learning should be broken down into small units to assure success at each step."

The Q-Sort technique forces all 28 items into a 7 point continuum ranging from 1 ("most unlike my teaching") to 7 ("most like my teaching"). Two teaching statements are allowed on points 1 and 7, three on points 2 and 6, four on points 3 and 5, and eight on point 4. A total score for each of the four families was derived by adding the scores for the seven statements that represent a specific family.

Teachers were given 28 note cards with one of the 28 statements. They were asked to sort out the cards into piles according to the configuration stated above.

Teaching Style Q-Sort raw and mean were recorded for each teacher. The highest and lowest score by family was noted, as well as the highest and lowest score for each teacher. The mean score by family was compared to the national mean. (Heikkinen, 1977)

Through factor loading, Heikkinen (Heikkinen, 1977) has shown a close relationship between Social Interaction and Personal families and between Information-Processing and Behavior Modification. Validity and reliability of this instrument has been described in detail elsewhere. (Heikkinen, 1977; Steel and Torrie, 1960; Comrey, 1973)

Interview

The purpose of the interview (Appendix B) was to assess the attitudes, values, and teaching methods of each teacher based on a verbal self-assessment. The open-ended questions required the subjects to formulate their own answers from personal experience. Questions focused on the subjects' assessment of their teaching style, student characteristics, teaching strategies, and course and curriculum design. Examples of questions are:

- If you could use three words or phrases to describe your teaching style, what would they be?

- What would a successful student look like when she or he finished your course?

- Let's suppose you could design your classes in any way you wanted. What would they look like? If you could design the academic requirements of your department, what would the focus be?

Responses to the interview were examined by classifying according to family. This classification was done by first examining the substantative content of the Teaching Style Q-Sort statements by family. Interview responses were then summarized for each teacher. Based on this summary, teacher responses were ranked according to how closely the content of the responses matched the content of the family statements. This ranking was compared to Teaching Style Q-Sort scores.

The content validity of the interview protocol was assured by pilot testing the instrument on two college professors.

Classroom Observation

This technique was used to identify actual classroom behaviors. The observation system was based on a modified version of Goldhammer's note-taking procedure. The purpose of this note-taking procedure is to portray the classroom activities objectively and comprehensively so activities can be

reconstructed with as much validity as possible. The investigator recorded everything that was seen or heard without interpretation. Data was analyzed by scanning the notes for repetitious behaviors, labeling patterns, and arranging the patterns in hierarchical order.

At this point, behaviors typifying each family (Appendix C) were compared with classroom behaviors. Based on classroom behaviors, each teacher was assigned to one of the four families. The assigned family was compared with the scores on the Teaching Style Q-Sort and the interview. The purpose of this comparison was to determine if the teachers' espoused-theories-of-teaching (what they said they did) were the same as the teachers' theories-in-practice (what they actually did). The observations were also examined for teachers as a group in order to make general observations about the group as a whole. No test for validity or reliability was done on the modified instrument.

Learning Styles Inventory

To assess learning styles of both the faculty and students in our sample were administered the Learning Style Inventory (Kolb, 1978), (Appendix D), a self-report instrument that can be administered in approximately ten minutes. It consists of nine items with each item consisting of four words. For example, one item consists of words "feeling, watching, thinking, doing." Respondents are asked to rank order the items according to how well each word characterizes their learning styles. One word in each item represents one of the four learning style dimensions.

By using the Learning Style inventory, two types of information are gathered from each respondent. One is the relative emphasis the respondent gives to each of the four learning dimensions (Appendix E). In other words, does the individual emphasize concrete experience more than reflective observations. The second type of information gathered is a combination score which indicates the degree to which the individual emphasizes abstractness over concreteness and action over reflection.

Split half reliabilities for the two combination scores (AcCE and AeRO) are around .80 for the five samples reported in the manual. Reliability coefficients for the single scores (AC, CE, AE, RO) are somewhat lower and reflect a greater range.

Procedures

During the Fall quarter of the academic year, the investigator met with the dental auxillary faculty at a staff meeting to explain the purpose and procedures of the study. Winter quarter the 38 faculty members were called to determine their interest in participating. Late Winter quarter and Spring quarter the Teaching Style Q-Sort and interviews were administered to six teachers. Spring quarter classroom observations were done. The Learning Styles Inventory for teachers data and students were collected as part of another study (Carrier, Newell, and Lange, 1981.)

The Teaching Style Q-Sort and interviews were done individually with each instructor. The Teaching Style Q-Sort was completed first, in about 20 minutes. Then immediately the 45-60 minute taped interview took place.

Each teacher was observed twice for 45 minutes. One teacher was observed for 90 minutes.

In the Carrier, Newell, and Lange study, the Learning Styles Inventory received by faculty through the mail, was completed individually and returned. Students completed the inventory after class time.

At the end of the study the investigator discussed the results of the study with four of the teachers and mailed results to two of the teachers. When asked, the investigator commented on the positive aspects of each teachers' methods and made suggestions for improvement.

The Learning Style Inventory and Teaching Style Inventory scores were compared. In addition, the score of the teachers' Learning Style Inventory was compared with the score each perceived the students would receive on the inventory. These scores were compared with students' actual scores.

RESULTS

Teaching Style Q-Sort

Table 1 shows the raw scores for each teacher, the high and low scores by family and by individual teacher, and the mean of the teachers compared with the national mean.

Teacher 4's highest individual score (36) was in the social interaction family. This was also the highest score of all teachers for that family. Teacher 1's lowest individual score (26) was in the social interaction family. This was the lowest of all teachers for that family.

There was the same kind of consistency between scores by family and teacher for Teacher 5 (Information-Processing and Personal) and Teachers 2 and 3 (Personal). Consistent low scores by family and teacher occurred for Teacher 5 (Personal) and Teacher 3 (Behavior Modification).

The teachers' mean for the social interaction, information-processing, and personal families were very similar to the national mean. The teachers' mean score for the behavior modification family was significantly lower then the national mean.

Interview

Table 2 shows the ranked family orientation for each teacher after summary responses to the ten questions were analyzed.

Three of the teachers' answers to the interview questions indicate a preference to the information-processing family. Teacher 6 provided a good example of this kind of response.

QUESTION 1: If you could use three words or phrases to describe your teaching style, what would they be?

Teacher 6: "Organized, structured approach, clinical application. I try to create in the students an appreciation for the subject, for the body of knowledge."

One of the teachers indicated an orientation to Social Interaction. For this person, the response to Question 1 was:

Teacher 4: "Like small groups, inquiry, discussion, application oriented."

Two of the teachers indicated an orientation to the Personal family. Their responses to Question 1 were:

Teacher 1: "Participation in students, encourage students to be self-directed, provide guidance rather than direction."

Teacher 2: "Open, questioning, enthusiastic. I think content is neat, and students are neat. I get turned on by it."

There was a difference between the responses of teachers who scored the highest and lowest in each family. Question 2 serves as a good example when looking at the differences between the opinions of Teachers 2 and 5. Teacher 2 scored highest on Personal and lowest on Information-Processing of all the teachers. Teacher 5 scored highest on Information-Processing and lowest on Personal of all the teachers.

QUESTION 2: Some people feel that the teacher is responsible for the students' learning; others feel it is the students. How do you feel about this issue?

Teacher 2: "I agree with both statements. They are mutually responsible."

Teacher 5: "It's the students responsibility. Teachers only have to present material in a form students can understand."

Observations

Column 3 of Table 3 shows the family each teacher was assigned to after the classroom observations were done. Generally, the families to which each teacher was assigned for observation were the same as the interviews and

observations. As an example of an exception, Teacher 6 was assigned to the Information-Processing family based on the interview and to the Behavior Modification family based on the observation.

The following is a summary description of the teacher observations:

- Teacher 1. Friendly; open; lots of interaction between teacher and students and among students; lively class climate; little note-taking; interaction changed from lecture to dialogue; reinforced students for answers; open nonverbals; moved around; climate caused discipline and closure problems.

- Teacher 2. Attentive; open; affirming nods; related own experiences; turned discussion over to students; synthesized information; asked evaluation questions; varied instructional mode.

- Teacher 3. Open; supportive; creative; used examples from own experience; provided feedback through paraphrase; posed open-ended questions; questions required students to synthesize and evaluate; lots of dialogue and interaction; asked for students' opinions; little note-taking; wide nonverbals.

- Teacher 4. Lecture: content-oriented; seemed to be content expert; gave many examples showing application; asked few questions of students; little interaction; much note-taking; fast delivery; good eye contact; open nonverbals.

  Seminar: Lots of question-asking; evaluated; synthesized; interactive; acted as resource; open; humorous.

- Teacher 5. Rigid lecture format; went through glossary item-by-item; content-centered; repetitive; much note-taking, didn't reinforce student questions; supplemented with many examples; restructured nonverbals; intonation good.

- Teacher 6. Lecture mode; organized; minimal interaction; relied on outline; little question-asking; provided answers to own questions; questioned on recall level; lots of note-taking; students mumbled during lecture; narrow nonverbals.

Learning Styles Inventory

(Table 4) In the sample of five teachers (Teacher 5 was not given the Learning Styles Inventory), two were divergers, two were convergers, and one was an accommodator. With this size sample, no generalization can be made about the relationship of teaching style to learning style.

It is interesting to note though that none of the teachers perceived the students' learning styles to be like their own learning style. This is a different outcome than determined by the Carrier, Newell, and Lange study.

In their study, 82 percent of the teachers perceived the students' learning style to be like their own. Approximately 78 percent of the 26 teachers tested were accommodators or divergers, 84 percent of the students were accommodators or divergers. And, 82 percent perceived their students as being accommodators or divergers. In this study, three of the five teachers perceived their students to be accommodators; one identified their students as convergers, and one as assimilators. The difference in sample size probably contributed to the difference in results.

Conclusions

Because this study is not statistically based, observations about the relationships among the four instruments and the concept of implicit theories are general in nature.

- The teachers of this study have different styles regardless of similarities in age, teaching experience, and educational level.

- The teachers in this study have a similar orientation to those in the national sample in social interaction, information-processing, and personal families. For behavior modification, the national mean is significantly higher (27.45) than the dental auxillary teachers (19.83). This may be because the national mean incorporates the scores of elementary and special education teachers; these teachers are perhaps more likely than college instructors to use behavior modification techniques.

- The teachers in this study exhibit the same kind of positive relationship between scores on Social Interaction and Personal families and between Information-Processing and Behavior Modification families. That is to say, for example, if a teacher scored high on Personal, they scored low on Behavior Modification. If they scored highest on Personal, they also scored high on Social Interaction.

- Generally, teachers' orientations to a family (style) on the Teaching Style Q-Sort and on the interview and observation instruments were consistent.

- There does not appear to be a relationship between Teaching Style Q-Sort scores and Learning Style Inventory scores.

- Teachers in this sample did not perceive students' learning styles to be like their own learning style.

- Three of the five teachers identified their students as accommodators. This is an accurate perception because, in fact, 84 percent of the dental hygiene students were accommodators.

RECOMMENDATIONS

This study serves as a pilot for future studies. While several interesting relationships were determined, major recommendations for improving the procedures should be noted.

Further research in this area should include:

- A larger sample for increased data accuracy;
- More observations for increased data accuracy;
- More interview questions for a greater diversity of types of response;
- Videotaping of classroom sessions for more accurate recall of behavior;
- Use of a different observation system, using several different raters; and
- Use of different instruments to identify implicit theories about teaching, teaching behaviors, and learning styles.

Based on this study, there are many implied areas for future study. Questions that are created as a result of this study are:

- How do teachers learn to recognize their own implicit theories?
- How does "student pull" affect a teacher's behavior?
- How do teachers learn to analyze different student learning styles?
- How do teachers learn to accommodate different student learning styles?
- How does the organizational structure of the institution affect the teacher's implicit theories and behaviors?

SUMMARY

This study examined the relationship of teaching style orientation, expressed perceptions of the teaching-learning process and learning styles. Four instruments were used on six dental auxillary faculty to assess this relationship. The instruments were the Teaching Style Q-Sort, an interview protocol, classroom observations modified from Goldhammer's note-taking procedure, and the Learning Style Inventory.

It was found that teachers' perceptions of their teaching style were positively related to their classroom behaviors. That is, what teachers thought they did was very close to their actual behavior. No relationship was determined for the teaching style and learning style inventories, although three of the five did accurately predict their students' learning style. It was found that teachers in this study did not perceive their students' learning style to be like their own.

Recommendations for future studies of this kind include using a large sample, increasing the number of interview questions, and increasing the number of classroom observations.

References

Argyris, C. and Schon, D. A. Theory in practice: Increasing professional effectiveness. San Francisco: Jossey-Bass, 1974.

Carrier, C. and McInerney, R. Teacher Development. New York: McMillan, 1981.

Carrier, C., Newell, K. and Lange, A. The Relationship of Learning Styles to Reference for Instructional Activities. Unpublished paper. University of Minnesota, 1981.

Comrey, A. L. A First Course in Factor Analysis, New York: Academic Press, 1973.

Duffy, G. A study of teacher conceptions of reading. Paper presented to The National Reading Conference. New Orleans, 1977.

Goldhammer, R. Clinical supervision: Special methods for the supervision of teachers. New York: Holt, Rinehart and Winston, 1969.

Heikkinen, M. W. The Teaching Style Q-Sort and its use in examining relationships between teaching style and selected teacher variable. Unpublished doctoral dissertation. University of Idaho, 1977. (77-19, 960).

Hunt, D. E. How to be your own best theorist. Theory in Practice. Autumn, 1980, 19 (4), 287-293.

Hunt, D. E. Teachers are psychologists, too: On the application of psychology to education. Canadian Psychological Review. 1976, 17, 210-218.

Hunt, D. E. Theorists are persons, too. On preaching what you practice. In C. Parker (Ed.), Encouraging Student Development in College. Minneapolis: University of Minnesota Press, 1978, pp. 250-266.

Janesick, V. An ethnographic study of a teacher's classroom perspective. Unpublished doctoral dissertation, Michigan State University, 1977.

Joyce, B. and Weil, M. Models of Teaching. Englwood Cliffs, N. J.: Prentice-Hall, 1972.

Kolb, D. A. Learning style inventory technical manual. Boston: McBer and Company, 1978.

Kolb, D. A. Disciplinary inquiry norms and student learning styles: Diverse pathways for growth. In A. Chickering (Ed.), The future American college. San Francisco: Jossey-Bass, 1981.

Kolb, D. A. and Fry, R. Toward an applied theory of experiential learning. In C. Cooper (Ed.), Theories of group processes. London: John Wiley, 1975.

Knox, A. B. Adult development and learning. San Francisco: Jossey-Bass, 1977.

Price, G. E., Dunn, R., and Dunn, K. Summary of research on learning style based on the Learning Style Inventory. Paper presented at the annual meeting of the American Educational Research Association. New York, 1977.

Sadler, G. E., Plovnick, M., and Snope, F. Learning styles and teaching implications. Journal of Medical Education, 1978, 53, 847-849.

Teaching Style Q-Sort (TSQS) Scores

Teacher	Social Interaction		Information Processing		Personal		Behavior Modification	
1	26	–f	27		34	+t	20	–t
2	35		23	–f	36	+f +t	18	–t
3	33		27		36	+f	16	–f –t
4	36	+f +t	28		27		21	–t
5	28		35	+f +t	23	–f –t	26	+f
6	32		34	+t	28		18	–t

TEACHERS' MEAN	31.66	29.00	30.66	19.83
NATIONAL MEAN	28.22	25.71	30.77	27.43

+f is highest score by family (read down)
-f is lowest score by family (read down)
+t is highest score for teacher (read across)
-t is lowest score for teacher (read across)

TABLE 1.

Interview Responses Ranked by Family

Teacher	Social Interaction	Information Processing	Personal	Behavior Modification
1	1	3	2	4
2	2	3	1	4
3	2	3	1	4
4	2	1	2	3
5	4	1	3	2
6	2	1	3	4

Comparison of Highest Scores by Family for the 3 Instruments

Teacher	TSQS	Interview	Observation
1	P	SI	SI
2	P SI	P	P
3	P	P	P
4	SI	IP	IP
5	IP	IP	IP
6	IP	IP	BM

SI — Social Interaction Family
IP — Information Processing Family
P — Personal Family
BM — Behavior Modification Family

NOTE: For Teacher 2, there was only one point difference between P and SI on the TSQS

TABLE 3.

Comparison of Highest Teaching Style Q-Sort (TSQS) and Learning Style Inventory (LSI) Scores

Teacher	TSQS	LSI	Teacher Perspection of Students' LSI*
1	Personal	Diverger	Accommodator
2	Personal (Social Interaction)	Converger	Accommodator
3	Personal	Accommodator	Converger
4	Social Interaction	Diverger	Assimilator
5	Information Processing		
6	Information Processing	Converger	Accommodator

NOTE: Teacher 5 was not included in the Learning Styles Assessment.

*84% of students are divergers and accommodators

TABLE 4.

Appendix A

TEACHING STYLE Q-SORT QUESTIONS

(Letters in parenthesis refer to family identification and were not included on original TSQS.)

1. Students should have control over the selection of activities so that he/she selects his/her own instructional outcomes (P).

2. Education should emphasize the importance of group problem solving (SI).

3. Concepts are the basis of knowledge (IP).

4. The teacher's task is one of establishing behaviors and then bringing out those behaviors under the control of the environment (BM).

5. Instruction should emphasize the maximization of unique personal development (P).

6. The social involvement of group investigation is a route to academic inquiry (SI).

7. Instruction should improve the student's ability to process information (IP).

8. Effective reinforcement should immediately follow a response (BM).

9. The teacher should recognize that the individual is capable of handling his/her own learning in constructive ways (P).

10. The teacher should take a role as a part of the group and be an active inquirer with the students (SI).

11. Students should recognize the tentative and emergent nature of knowledge (IP).

12. The sequence of learning should be broken down into small units to assure success at each step (BM).

13. Teachers should provide environments which are likely to increase the student's capacity to develop himself/herself (P).

14. The school has to be an active participant in the continuing development of culture (SI).

15. The "academic disciplines have a structure of concepts which form the information-processing system of the discipline" (IP).

16. Postive and negative reinforcement both can increase response probability (BM).

17. Teachers should keep "the students' feelings and problems at the center of the teaching process" (P).

18. In a complex, interdependent world, the individual's well-being is closely related to the larger social structure (SI).

19. The task of the school is to identify clear, stable, and organized bodies of knowledge within the disciplines (IP).

20. Teachers are able to define all goals and objectives in terms of observable behavior (BM).

21. The "student must take responsibility for initiating and maintaining learning activities" (P).

22. Instruction should emphasize the relationships of the person to society (SI).

23. Good lectures and demonstrations can lead to meaningful learning (IP).

24. Programmed instruction can be successfully used with any subject area, grade level, and behavior (BM).

25. The teacher "must be acceptant of all responses in order to insure that students feel no external judgments on their creative expression" (P).

26. Intellectual operations are learned when students are engaged in active dialogue (SI).

27. The role of the teacher is to retain control of the intellectual structure of the classroom (IP).

28. Behavior modification can be used to extinguish objectionable behavior as well as to establish behavior responses in subject matter areas (BM).

Appendix B

TEACHING STYLE INTERVIEW

Taping Includes:

- o Teaching Style Q-Sort
- o Date
- o Time
- o Interviewee
- o Permission to tape, I'll be taking some notes.

Instructions

- o I'll ask a series of questions.
- o Take your time when answering, answer as fully as possible.
- o When answering focus on the class that you will be teaching Spring quarter, i.e., the one I'll be observing.
- o After the interview, I'll summarize your answers to check that what you said is what I heard.

Questions:

1. a. If you could use three (3) words or phrases to describe your teaching style, what would they be?

   b. Can you tell me more about what you mean?

Let's focus on the students for a few minutes.

2. Some people feel that the teacher is responsible for the students' learning, others feel it is the students' responsibility. How do you feel about this issue?

3. What would a successful student look like when she or he finished your course? Is there anything else?

4. a. Could you describe to me your most successful relationship with a student?

   b. If you wouldn't mind, tell me about one that you define as less than successful.

Now let's switch our focus to your teaching.

5. a. Let's supppose you could design your classes in any way you wanted, what would those classes look like? Forget about the University constraints. You have all the money, resources, assistance, and good students that you want.

   b. Let's do the same thing with the dental hygiene department. If you could design the academic requirement of your department, what would the focus be?

6. a. Which teaching strategies do you consider to be the most useful? Rank order your preferences. These are some possibilities - lecture, group discussion, individualized learning, small group projects, demonstrations.

   b. What is it about the first two items that you find useful?

7. a. Having said all of that, would you describe to me how your Spring quarter class is structured? What would the syllabus look like?

   b. How did you come to choose this approach?

   c. Who set the goals for the course - you, students, department?

8. a. How frequently do you assign papers or projects?

   b. Do you incorporate drill-and-practice?

   c. How frequently do you test?

9. a. How do you feel about the requirement to assign grades for student performance?

   b. Do you feel a grade is a reward for a job well done, a motivator to do better, or something else?

10. If you could take a year off to study teaching, what aspects would you study? How would you go about this?

Appendix C

CLASSROOM BEHAVIORS CATEGORIZED BY FAMILY

Teaching Style Q-Sort Questions

1. Education should emphasize the importance of group problem solving (SI).

2. The social involvement of group investigation is a route to academic inquiry (SI).

3. The teacher should take a role as a part of the group and be an active inquirer with the students (SI).

4. Students should recognize the tentative and emergent nature of knowledge (IP).

5. Teachers should provide environments which are likely to increase the student's capacity to develop himself/herself (P).

6. Instruction should emphasize the relationships of the person to society (SI).

7. Intellectual operations are learned when students are engaged in active dialogue (SI).

Behaviors

If teachers' behaviors portray social interaction, they might:

- o Ask open-ended questions
- o Refer to we
- o Talk about person's role in discipline

- o Create group discussion
- o Role-play
- o Create projects which involve the community
- o Design field trip
- o Discuss values clarification
- o Encourage student to lead discussions
- o Create a model environment

INFORMATION-PROCESSING

Teaching Style Q-Sort Questions

1. Concepts are the basis of knowledge (IP).

2. Instruction should improve the student's ability to process information (IP).

3. Students should recognize the tentative and emergent nature of knowledge (IP).

4. The "academic disciplines have a structure of concepts which form the information-processing system of the discipline" (IP).

5. The task of the school is to identify clear, stable, and organized bodies of knowledge within the disciplines (IP).

6. Instruction should emphasize the relationships of the person to society (SI).

7. The role of the teacher is to retain control of the intellectual structure of the classroom (IP).

Behaviors

If teachers' behaviors portray information-processing, the might:

- o Use a socratic method
- o Use a problem-solving approach
- o Use a discovery-inquiry approach
- o Use advanced organizers
- o Require that inductive and deductive reasoning be used
- o Analyze and generalize
- o Emphasize the cognitive
- o Emphasize memorization of facts
- o Ask broad statements
- o Present a logical organization of knowledge

PERSONAL

Teaching Style Q-Sort Questions

1. Students should have control over the selection of activities so that he/she selects his/her own instructional outcomes (P).

2. The teacher's task is one of establishing behaviors and then bringing out those behaviors under the control of the environment (BM).

3. The teacher should recognize that the individual is capable of handling his/her own learning in constructive ways (P).

4. Teachers should provide environments which are likely to increase the student's capacity to develop himself/herself (P).

5. Teachers should keep "the students' feelings and problems at the center of the teaching process" (P).

6. The "student must take responsibility for initiating and maintaining learning activities" (P).

7. The teacher "must be acceptant of all responses in order to insure that students feel no external judgments on their creative expression" (P).

Behaviors

If a teachers' behaviors portray the personal family, they might:

- o Use individual contracting
- o Interview and consult with students
- o Employ learning centers
- o Allow students to speak spontaneously
- o Allow students so choose their own activities
- o Create many choices for activities
- o Develop loosely structured lesson plans
- o Accept students' ideas by paraphrasing, restating, summarizing
- o Allow students to initiate interaction
- o Ask for students' opinions
- o Make students accountable

BEHAVIOR MODIFICATION

Teaching Style Q-Sort Questions

1. The teacher's task is one of establishing behaviors and then bringing out those behaviors under the control of the environment (BM).

2. Effective reinforcement should immediately follow a response (BM).

3. The sequence of learning should be broken down into small units to assure success at each step (BM).

4. Teachers should provide environments which are likely to increase the student's capacity to develop himself/herself (P).

5. Teachers are able to define all goals and objectives in terms of observable behavior (BM).

6. Programmed instruction can be successfully used with any subject area, grade level, and behavior (BM).

7. Behavior modification can be used to extinguish objectionable behavior as well as to establish behavior responses in subject matter areas (BM).

Behaviors

If teachers' behaviors portrayed the behavior modification, they might:

- o Serve as a model for desirable behavior
- o Use programmed instruction
- o Control the environment
- o Use drill-and-practice
- o Set a pre-determined sequence of activities
- o Ask narrow statements
- o Make evaluative comments
- o Create external rewards
- o Repeat the content

Appendix D

LEARNING STYLE INVENTORY

This inventory is designed to assess your method of learning. As you take the inventory, give a high rank to those words which best characterize the way you learn and a low rank to the words which are the least characteristic of your learning style.

You may find it hard to choose the words that best describe your learning style because there are not right or wrong answers. Different characteristics described in the inventory are equally good. The aim of the inventory is to describe how you learn, not to evaluate your learning ability.

INSTRUCTIONS

There are nine sets of four words listed below. Rank order each set of four words assigning a 4 to the word which best characterizes your learning style, a 3 to the word which next best characterizes your learning style, a 2 to the next most characteristic word, and a 1 to the word which is least characteristic of you as a learner. Be sure to assign a different rank number to each of the four words in each set. Do not make ties.

1.	___ discriminating	___ tentative	___ involved	___ practical
2.	___ receptive	___ relevant	___ analytical	___ impartial
3.	___ feeling	___ watching	___ thinking	___ doing
4.	___ accepting	___ risk-taker	___ evaluative	___ aware
5.	___ intuitive	___ productive	___ logical	___ questioning
6.	___ abstract	___ observing	___ concrete	___ active
7.	___ present-oriented	___ reflecting	___ future-oriented	___ pragmatic
8.	___ experience	___ observation	___ conceptualization	___ experimental
9.	___ intense	___ reserved	___ rational	___ responsible

FOR SCORING ONLY

CE	RO	AC	AE
_____	_____	_____	_____
234578	136789	234589	136789

From Organizational Psychology, an Experiential Approach, by D. A. Kolb, I. M. Rubin, and J. M. McIntyre. Prentice-Hall, 1971.

Appendix E

LEARNING STYLE INVENTORY

SCORING GRAPH